The Story of Psychology

PROLOGUE OVERVIEW

Psychology's historical development and current activities lead us to define the field as the science of behavior and mental processes. This Prologue discusses the development of psychology from ancient times until today and the range of behaviors and mental processes being investigated by psychologists in each of the various specialty areas. In addition, it introduces the biopsychosocial approach that integrates the three main levels of analysis followed by psychologists working from the seven major perspectives. Next is an overview of the diverse subfields in which psychologists conduct research and provide professional services.

The Prologue concludes with a Close-Up explaining how to get your study of psychology off on the right foot by learning (and pledging to follow!) the SQ3R study method. This study method is also discussed in the essay at the beginning of this Study Guide.

NOTE: Answer guidelines for all Prologue questions begin on page 9.

PROLOGUE REVIEW

First, skim each section, noting headings and boldface items. After you have read the section, review each objective by answering the fill-in questions that follow it. As you proceed, evaluate your performance by consulting the answers on page 9. Do not continue with the next section until you understand each answer. If you need to, review or reread the section in the textbook before continuing.

What Is Psychology? (pp. 2–6)

Objective 1: Describe the evolution of psychology from its early pioneers to contemporary concerns.

1. Psychological science seeks to answer questions about how people ____________, ____________, and ____________ as they do.

2. The Greek philosopher ____________ developed early theories about ____________, ____________, ____________, ____________, and ____________.

3. The first psychological laboratory was founded in 1879 by Wilhelm ____________, His student, ____________, introduced the school of ____________, which explored the basic elements of mind using the method of ____________. This method proved ____________ (reliable/unreliable).

4. Under the influence of evolutionary theorist Charles Darwin, psychologist ____________ assumed that thinking developed because it was ____________. He founded the school of ____________, which focused on how mental and behavioral processes enable the organism to adapt, survive, and flourish.

5. The first female president of the American Psychological Association was ____________. The first woman to receive a Ph.D. in psychology was ____________. 
Objective 2: Describe the evolution of psychology as defined from the 1920s through today.

6. The historical roots of psychology include the fields of ____________ and ____________.

7. Some early psychologists included Ivan Pavlov, who pioneered the study of ____________; the personality theorist ____________; and Jean Piaget, who studied ____________.

8. In its earliest years, psychology was defined as the science of ____________ life. From the 1920s into the 1960s, psychology in America was redefined as the science of ____________ behavior.

9. As a response to Freudian psychology and to ____________, which they considered too mechanistic, pioneers ____________ and ____________ forged ____________ psychology. This new perspective emphasized the ____________ potential of ____________ people.

10. During the 1960s, psychology underwent a ____________ revolution as it began to recapture interest in how our ____________ processes and retains information. The study of brain activity linked with mental activity is called ____________.

11. The text author defines psychology as the scientific study of ____________ and ____________ processes.

12. In this definition, “behavior” refers to any action that we can ____________ and ____________, and “mental processes” refers to the internal, ____________ from behavior.

13. As a science, psychology is less a set of findings than a way of ____________.

Contemporary Psychology (pp. 6–11)

1. Worldwide, the number of psychologists is ____________ (increasing/decreasing). Thanks to international publications and meetings, psychological science is also ____________.

Objective 3: Summarize the nature-nurture debate in psychology, and describe the principle of natural selection.

2. The nature-nurture issue is the controversy over the relative contributions of ____________ and ____________.

3. The Greek philosopher who assumed that character and intelligence are inherited is ____________. The Greek philosopher who argued that all knowledge comes from sensory experience is ____________.

4. In the 1600s, the views of the Greek philosophers were revived by ____________, who believed that most knowledge comes in through the senses, and ____________, who believed that some ideas are innate.

5. In 1859, naturalist ____________ explained species variation by proposing the process of ____________, which works through the principle of ____________.

6. Although the debate continues, we will see that ____________ works on what ____________ endows and that every ____________ event is simultaneously a ____________ event.

Objective 4: Identify the three main levels of analysis in the biopsychosocial approach, and explain why psychology’s varied perspectives are complementary.

7. Each person is a complex ____________ that is part of a larger ____________ and at the same time composed of smaller systems. For this reason,
psychologists work from three main
biological, ________________, and
which together form an integrated
_______________ approach to the study of
behavior and mental processes.

8. Psychologists who study how the body and brain
enable emotions, memories, and sensory experi-
ences are working from the ________________
perspective.

9. Psychologists who study how natural selection
influences behavior tendencies are working from
the ________________ perspective, whereas
those concerned with the relative influences of
genes and environment on individual differences
are working from the ________________
perspective.

10. Psychologists who believe that behavior springs
from unconscious drives and conflicts are work-
ing from the ________________
perspective.

11. Psychologists who study the mechanisms by
which observable responses are acquired and
changed are working from the
_______________ perspective.

12. The ________________ perspective explores
how we encode, process, store, and retrieve
information.

13. Psychologists who study how thinking and
behavior vary in different situations are working
from the ________________.
_______________ perspective.

14. The different perspectives on the big issues
_______________ (contradict/complement)
one another.

Objective 5: Identify some of psychology’s subfields,
and explain the difference between clinical psychol-
ogy and psychiatry.

15. Psychologists may be involved in conducting
_______________, which builds psychology’s knowledge base, or
which seeks solutions to practical problems.

16. Psychologists who help people cope with prob-
lems in living are called ________________
psychologists. Psychologists who study, assess,
and treat troubled people are called
______________ psychologists.

17. Medical doctors who provide psychotherapy and
treat physical causes of psychological disorders
are called ________________.

Close-Up: Tips for Studying Psychology
(p. 12)

Objective 6: Describe several effective study
techniques.

1. To master any subject, you must
______________ process it.

2. The ________________ study method incor-
porates five steps: a. ________________,
b. ________________, c. ________________,
d. ________________, and
e. ________________.

List five additional study tips identified in the text.

a. ________________
b. ________________
c. ________________
d. ________________
e. ________________

PROGRESS TEST 1

Multiple-Choice Questions

Circle your answers to the following questions and
check them with the answers beginning on page 9. If
your answer is incorrect, read the explanation for
why it is incorrect and then consult the appropriate
pages of the text (in parentheses following the correct
answer).

1. In its earliest days, psychology was defined as the
a. science of mental life.
b. study of conscious and unconscious activity.
c. science of observable behavior.
d. science of behavior and mental processes.
2. Who would be most likely to agree with the statement, "Psychology should investigate only behaviors that can be observed"?
   a. Wilhelm Wundt
   b. Sigmund Freud
   c. John B. Watson
   d. William James

3. Today, psychology is defined as the
   a. science of mental phenomena.
   b. science of conscious and unconscious activity.
   c. science of behavior.
   d. science of behavior and mental processes.

4. Who introduced the early school of structuralism?
   a. Edward Titchener
   b. Wilhelm Wundt
   c. William James
   d. Mary Whiton Calkins

5. Who wrote the early textbook Principles of Psychology?
   a. Wilhelm Wundt
   b. Ivan Pavlov
   c. Jean Piaget
   d. William James

6. Psychologists who study the degree to which genes influence our personality are working from the ________ perspective.
   a. behavioral
   b. evolutionary
   c. behavior genetics
   d. neuroscience

7. Which of the following exemplifies the issue of the relative importance of nature and nurture on our behavior?
   a. the issue of the relative influence of biology and experience on behavior
   b. the issue of the relative influence of rewards and punishments on behavior
   c. the debate as to the relative importance of heredity and instinct in determining behavior
   d. the debate as to whether mental processes are a legitimate area of scientific study

8. The seventeenth-century philosopher who believed that the mind is blank at birth and that most knowledge comes through sensory experience is
   a. Plato.
   b. Aristotle.
   c. Descartes.
   d. Locke.

9. Which seventeenth-century philosopher believed that some ideas are innate?
   a. Aristotle
   b. Plato.
   c. Descartes
   d. Locke.

10. Which psychological perspective emphasizes the interaction of the brain and body in behavior?
   a. neuroscience
   b. cognitive
   c. behavioral
   d. behavior genetics

11. A psychologist who explores how Asian and North American definitions of attractiveness differ is working from the ________ perspective.
   a. behavioral
   b. evolutionary
   c. cognitive
   d. social-cultural

12. A psychologist who conducts experiments solely intended to build psychology’s knowledge base is engaged in
   a. basic research.
   b. applied research.
   c. industrial-organizational research.
   d. clinical research.

13. Psychologists who study, assess, and treat troubled people are called
   a. basic researchers.
   b. applied psychologists.
   c. clinical psychologists.
   d. psychiatrists.

14. Today, psychology is a discipline that
   a. connects with a diversity of other fields.
   b. is largely independent of other disciplines.
   c. is focused primarily on basic research.
   d. is focused primarily on applied research.

15. (Close-Up) In order, the sequence of steps in the SQ3R method is
   a. survey, review, question, read, reflect.
   b. review, question, survey, read, reflect.
   c. question, review, survey, read, reflect.
   d. survey, question, read, review, reflect.

16. Psychologists who study how brain activity is linked to memory, perception, and other thought processes are called
   a. humanistic psychologists.
   b. psychiatrists.
   c. clinical psychologists.
   d. cognitive neuroscientists.
Matching Items

Match each psychological perspective, school, and subfield with its definition or description.

Terms

1. neuroscience perspective
2. social-cultural perspective
3. psychiatry
4. clinical psychology
5. behavior genetics perspective
6. behavioral perspective
7. industrial/organizational psychology
8. cognitive perspective
9. basic research
10. applied research
11. evolutionary perspective
12. psychodynamic perspective
13. structuralism
14. functionalism
15. behaviorism
16. cognitive neuroscience

Definitions or Descriptions

a. behavior in the workplace
b. how people differ as products of different environments
c. the study of practical problems
d. an early school of psychology that used introspection to explore the contents of the mind
e. the mechanisms by which observable responses are acquired and changed
f. how the body and brain create emotions, memories, and sensations
g. how we encode, process, store, and retrieve information
h. the view that psychology should be an objective science that avoids reference to mental processes
i. how natural selection favors traits that promote the perpetuation of one’s genes
j. the study, assessment, and treatment of troubled people
k. brain activity linked with perception, thinking, memory, and language
l. the disguised effects of unfulfilled wishes and childhood traumas
m. adds to psychology’s knowledge base
n. an early school of psychology that focused on the adaptive value of thoughts and behaviors
o. how much genes and environment contribute to individual differences
p. the medical treatment of psychological disorders

PROGRESS TEST 2

Progress Test 2 should be completed during a final chapter review. Answer the following questions after you thoroughly understand the correct answers for the section reviews and Progress Test 1.

Multiple-Choice Questions

1. The first psychology laboratory was established by _________ in the year _________.
   a. Wundt; 1879      c. Freud; 1900
   b. James; 1890      d. Watson; 1913

2. Who would be most likely to agree with the statement, “Psychology is the science of mental life”?
   a. Wilhelm Wundt
   b. John Watson
   c. Ivan Pavlov
   d. virtually any American psychologist during the 1960s

3. In psychology, behavior is best defined as
   a. anything a person says, does, or feels.
   b. any action we can observe and record.
   c. any action, whether observable or not.
   d. anything we can infer from a person’s actions.
4. Carl Rogers and Abraham Maslow are most closely associated with
   a. cognitive psychology.
   b. behaviorism.
   c. psychodynamic theory.
   d. humanistic psychology.

5. In defining psychology, the text notes that psychology is most accurately described as a
   a. way of asking and answering questions.
   b. field engaged in solving applied problems.
   c. set of findings related to behavior and mental processes.
   d. nonscientific approach to the study of mental disorders.

6. Two historical roots of psychology are the disciplines of
   a. philosophy and chemistry.
   b. physiology and chemistry.
   c. philosophy and biology.
   d. philosophy and physics.

7. The Greek philosopher who believed that intelligence was inherited was
   a. Aristotle.
   b. Plato.
   c. Descartes.
   d. Simonides.

8. The way we encode, process, store, and retrieve information is the primary concern of the
   a. neuroscience.
   b. evolutionary.
   c. social-cultural.
   d. cognitive.

9. Which of the following individuals is also a physician?
   a. clinical psychologist
   b. experimental psychologist
   c. psychiatrist
   d. biological psychologist

10. Dr. Jones' research centers on the relationship between changes in our thinking over the life span and changes in moral reasoning. Dr. Jones is most likely a
    a. clinical psychologist.
    b. personality psychologist.
    c. psychiatrist.
    d. developmental psychologist.

11. Which subfield is most directly concerned with studying human behavior in the workplace?
    a. clinical psychology
    b. personality psychology
    c. industrial/organizational psychology
    d. psychiatry

12. Dr. Ernst explains behavior in terms of different situations. Dr. Ernst is working from the
    a. behavioral
    b. evolutionary
    c. social-cultural
    d. cognitive

13. Which perspective emphasizes the learning of observable responses?
    a. behavioral
    b. social-cultural
    c. neuroscience
    d. cognitive

14. A psychologist who studies how worker productivity might be increased by changing office layout is engaged in
    a. applied
    b. basic
    c. clinical
    d. developmental

15. (Close-Up) A major principle underlying the SQ3R study method is that
    a. people learn and remember material best when they actively process it.
    b. many students overestimate their mastery of text and lecture material.
    c. study time should be spaced over time rather than crammed into one session.
    d. overlearning disrupts efficient retention.

16. The biopsychosocial approach emphasizes the importance of
    a. different levels of analysis in exploring behavior and mental processes.
    b. basic research over pure research.
    c. pure research over basic research.
    d. having a single academic perspective to guide research.

**True-False Items**

Place a T or an F in the blank next to each statement.

- 1. Psychology's three main levels of analysis often contradict each other.  
  - 2. The primary research tool of the first psychologists was the experiment.
  - 3. The subject matter of psychology has changed over the history of the field.
  - 4. Every psychological event is simultaneously a biological event.
  - 5. Today, most psychologists work within the behavioral perspective.
  - 6. The major perspectives in psychology contradict one another.
  - 7. (Close-Up) Spaced practice promotes better retention than massed practice.
  - 8. (Close-Up) Overlearning hinders retention.
9. A major goal of psychology is to teach us how to ask important questions and to think critically as we evaluate competing ideas.

10. The school of structuralism fell from favor in part because the method of introspection was unreliable.

PSYCHOLOGY APPLIED

Answer these questions the day before an exam as a final check on your understanding of the chapter’s terms and concepts.

Multiple-Choice Questions

1. Psychology is defined as the “science of behavior and mental processes.” Wilhelm Wundt would have omitted which of the following words from this definition?
   a. science
   b. behavior and
   c. and mental processes
   d. Wundt would have agreed with the definition as stated.

2. Jawan believes that psychologists should go back to using introspection as a research tool. This technique is based on
   a. survey methodology.
   b. experimentation.
   c. self-examination of mental processes.
   d. the study of observable behavior.

3. Dharma’s term paper on the history of American psychology notes that
   a. psychology began as the science of mental life.
   b. from the 1920s into the 1960s, psychology was defined as the scientific study of observable behavior.
   c. contemporary psychologists study both overt behavior and covert thoughts.
   d. all of these statements are true.

4. Terrence wants to talk to a professional to help him cope with some academic challenges he’s facing. You recommend that he contact a(n)
   a. industrial/organizational psychologist.
   b. developmental psychologist.
   c. counseling psychologist.
   d. psychiatrist.

5. Professor Gutierrez, who believes that human emotions are best understood as being jointly determined by heredity, learning, and the individual’s social and cultural contexts, is evidently a proponent of the
   a. psychodynamic perspective.
   b. biopsychosocial approach.
   c. evolutionary perspective.
   d. neuroscience perspective.

6. The philosophical views of John Locke are to those of René Descartes as __________ is to __________.
   a. nature; nurture
   b. nurture; nature
   c. rationality; irrationality
   d. irrationality; rationality

7. During his presentation on the history of psychology, Sanjay notes that Darwin’s theory led most directly to the development of the school of
   a. structuralism.
   b. behaviorism.
   c. functionalism.
   d. humanism.

8. In concluding her report on the “nature-nurture debate in contemporary psychology,” Karen notes that
   a. most psychologists believe that nature is a more important influence on the development of most human traits.
   b. most psychologists believe that nurture is more influential.
   c. the issue is more heatedly debated than ever before.
   d. nurture works on what nature endows.

9. Dr. Waung investigates how a person’s interpretation of a situation affects his or her reaction. Evidently, Dr. Waung is working from the __________ perspective.
   a. neuroscience
   b. behavioral
   c. cognitive
   d. social-cultural

10. Dr. Aswad is studying people’s enduring inner traits. Dr. Aswad is most likely a(n)
    a. clinical psychologist.
    b. psychiatrist.
    c. personality psychologist.
    d. industrial/organizational psychologist.
11. The psychological perspective that places the most emphasis on how observable responses are learned is the ________ perspective.
   a. behavioral    c. behavior genetics
   b. cognitive      d. evolutionary

12. During a dinner conversation, a friend says that the cognitive and behavioral perspectives are quite similar. You disagree and point out that the cognitive perspective emphasizes ________, whereas the behavioral perspective emphasizes ________.
   a. conscious processes; observable responses
   b. unconscious processes; conscious processes
   c. overt behaviors; covert behaviors
   d. introspection; experimentation

13. Concerning the major psychological perspectives on behavior, the text author suggests that
   a. researchers should work within the framework of only one of the perspectives.
   b. only those perspectives that emphasize objective measurement of behavior are useful.
   c. the different perspectives often complement one another; together, they provide a fuller understanding of behavior than provided by any single perspective.
   d. psychologists should avoid all of these traditional perspectives.

14. (Close-Up) Your roommate announces that her schedule permits her to devote three hours to studying for an upcoming quiz. You advise her to
   a. spend most of her time reading and rereading the text material.
   b. focus primarily on her lecture notes.
   c. space study time over several short sessions.
   d. cram for three hours just before the quiz.

15. (Close-Up) A fraternity brother rationalizes the fact that he spends very little time studying by saying that he “doesn’t want to peak too soon and have the test material become stale.” You tell him that
   a. he is probably overestimating his knowledge of the material.
   b. if he devotes extra time to studying, his retention of the material will be improved.
   c. the more often students review material, the better their exam scores.
   d. all of these statements are true.

16. The psychological views of William James are to those of Edward Titchener as ________ is to ________.
   a. nature; nurture
   b. nurture; nature
   c. structuralism; functionalism
   d. functionalism; structuralism

**Essay Question**

Explain how researchers working from each of psychology’s major perspectives might investigate an emotion such as love. (Use the space below to list the points you want to make, and organize them. Then write the essay on a separate piece of paper.)

**KEY TERMS**

Using your own words, on a separate piece of paper write a brief definition or explanation of each of the following.

1. structuralism
2. functionalism
3. behaviorism
4. humanistic psychology
5. cognitive neuroscience
6. psychology
7. nature-nurture issue
8. natural selection
9. levels of analysis
10. biopsychosocial approach
11. basic research
12. applied research
13. counseling psychology
14. clinical psychology
15. psychiatry
16. SQ3R
CHAPTER 1

Thinking Critically With Psychological Science

CHAPTER OVERVIEW

Chapter 1 explains the limits of intuition and common sense in reasoning about behavior and mental processes. To counteract our human tendency toward faulty reasoning, psychologists adopt a scientific attitude that is based on curiosity, skepticism, humility, and critical thinking. Chapter 1 also explains how psychologists, using the scientific method, employ the research strategies of description, correlation, and experimentation in order to objectively describe, predict, and explain behavior.

The next section discusses how statistical reasoning is used to help psychologists describe data and to generalize from instances. To describe data, psychologists often rely on measures of central tendency such as the mean, median, and mode, as well as variation measures such as the range and standard deviation. Statistical reasoning also helps psychologists determine when it is safe to generalize from a sample to the larger population.

Chapter 1 concludes with a discussion of several questions people often ask about psychology, including why animal research is relevant, whether laboratory experiments are ethical, whether behavior varies with culture and gender, and whether psychology’s principles don’t have the potential for misuse.

Chapter 1 introduces a number of concepts and issues that will play an important role in later chapters. Pay particular attention to the strengths and weaknesses of descriptive and correlational research. In addition, make sure that you understand the method of experimentation, especially the importance of control conditions and the difference between independent and dependent variables. Finally, you should be able to discuss three important principles concerning populations and samples, as well as the concept of significance in testing differences.

NOTE: Answer guidelines for all Chapter 1 questions begin on page 29.

CHAPTER REVIEW

First, skim each section, noting headings and boldface items. After you have read the section, review each objective by answering the fill-in questions that follow it. As you proceed, evaluate your performance by consulting the answers on page 29. Do not continue with the next section until you understand each answer. If you need to, review or reread the section in the textbook before continuing.

The Need for Psychological Science

(pp. 15–20)

Objective 1: Define hindsight bias, and explain how overconfidence contaminates our everyday judgments.

1. The tendency to perceive an outcome that has occurred as being obvious and predictable is called the _______________. This phenomenon is ________________ (rare/common) in ________________ (children/adults/both children and adults).

2. Our everyday thinking is also limited by ________________ in what we think we know.

3. Most people are ________________ (better/worse/equally wrong) in predicting their social behavior.

Objective 2: Explain how the scientific attitude encourages critical thinking.

4. The scientific approach is characterized by the attitudes of ________________, ________________, and ________________.
5. Scientific inquiry thus encourages reasoning that examines assumptions, discerns hidden values, evaluates evidence, and assesses conclusions, which is called _____________.

How Do Psychologists Ask and Answer Questions? (pp. 21–33)

Objective 3: Describe how psychological theories guide scientific research.

1. Psychological science uses the ____________ to evaluate competing ideas. They make careful ____________ and form ____________, which are _____________.

2. An explanation using an integrated set of principles that organizes and predicts behaviors or events is a _____________. Testable predictions that allow a scientist to evaluate a theory are called _____________. These predictions give direction to _____________.

3. In order to prevent theoretical biases from influencing scientific observations, research must be reported precisely—using clear _____________. All concepts should be _____________.

4. The test of a useful theory is the extent to which it effectively _____________. A range of self-reports and observations and implies clear _____________.

5. Psychologists conduct research using ____________, ____________, and _____________.

Objective 4: Compare and contrast case studies, surveys, and naturalistic observation, and explain the importance of random sampling.

6. The research strategy in which one or more individuals is studied in depth in order to reveal universal principles of behavior is the _____________.

7. Although case studies can suggest _____________. for further study, a potential problem with this method is that any given individual may be _____________.

8. The method in which a group of people is questioned about their attitudes or behavior is the _____________. An important factor in the validity of survey research is the _____________.

9. We are more likely to overgeneralize from select samples that are especially _____________.

10. Surveys try to obtain a _____________. sample, one that will be representative of the _____________. being studied. In such a sample, every person _____________. (does/does not) have a chance of being included.

11. Large, representative samples _____________. (are/are not) better than small ones.

12. The research method in which people or animals are directly observed in their natural environments is called _____________.

13. Case studies, surveys, and naturalistic observation do not explain behavior; they simply _____________. it.

14. Using naturalistic observation, researchers have found that people are more likely to laugh in _____________. situations than in _____________. situations. Also, using observations of walking speed and the accuracy of public clocks, researchers have concluded that the pace of life _____________. (varies/does not vary) from one culture to another.

Objective 5: Describe positive and negative correlations, and explain how correlational measures can aid the process of prediction but not provide evidence of cause-effect relationships.

15. When changes in one factor are accompanied by changes in another, the two factors are said to be _____________. and one is thus able to _____________. the other. The statistical expression of this relationship is called a _____________. A graphical representation of this relationship is called a _____________.

16. If two factors increase or decrease together, they are _____________.


If, however, one decreases as the other increases, they are _____________________________.
Another way to state the latter is that the two variables relate ______________________. 

17. A negative correlation between two variables does not indicate the ______________________ or ______________________ of the relationship. Nor does correlation prove _____________________; rather, it merely indicates the possibility of a ______________________ -____________________ relationship.

If your level of test anxiety goes down as your time spent studying for the exam goes up, would you say these events are positively or negatively correlated? Explain your reasoning.

18. A correlation between two events or behaviors means only that one event can be ______________________ from the other.

19. Because two events may both be caused by some other ______________________, a correlation does not mean that one ______________________ the other. For this reason, correlation thus does not enable ______________________.

Objective 6: Describe how people form illusory correlations, and explain the human tendency to perceive order in random sequences.

20. A perceived correlation that does not really exist is an ______________________
    ______________________.

21. People are more likely to notice and recall events that ______________________ their beliefs. This error in thinking helps explain many ______________________ beliefs.

22. Another common tendency is to perceive order in ______________________

23. Patterns and streaks in random sequences occur ______________________ (more/less) often than people expect, and they ______________________ (do/do not) appear random.

Objective 7: Explain how experiments help researchers isolate cause and effect, focusing on the characteristics of experimentation that make this possible.

24. To isolate ______________________ and ______________________, researchers ______________________ control for other ______________________.

25. Research studies have found that breast-fed infants ______________________ (do/do not) grow up with higher intelligence scores than those of infants who are bottle-fed with cow’s milk. To study cause-effect relationships, psychologists conduct ______________________. Using this method and ______________________ assigning participants to groups, a researcher ______________________ the factor of interest while ______________________ (controlling) other factors.

26. If a ______________________ changes when an ______________________ factor is varied, the researcher knows the factor is having an ______________________.

27. When neither the participants nor the person collecting the data knows which condition a participant is in, the researcher is making use of the ______________________ procedure.

28. Researchers sometimes give certain participants a pseudotreatment, called a ______________________, and compare their behavior with that of participants who receive the actual treatment. When merely thinking that one is receiving a treatment produces results, a ______________________
    ______________________ is said to occur.
29. An experiment must involve at least two conditions: the ________________ condition, in which the experimental treatment is present, and the ________________ condition, in which it is absent.

30. To ensure that the two groups are identical, experimenters rely on the ________________ of individuals to the experimental conditions.

31. The factor that is being manipulated in an experiment is called the ________________ variable. The measurable factor that may change as a result of these manipulations is called the ________________ variable.

32. The aim of an experiment is to ________________ a(n) ________________ variable, measure the ________________ variable, and ________________ all other variables.

Explain at least one advantage of the experiment as a research method.

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It is important to read the ________________ and note the ________________ to avoid being misled by misrepresented data.

Objective 9: Describe the three measures of central tendency, and identify the measure most affected by extreme scores.

3. The three measures of central tendency are the ________________, the ________________, and the ________________.

4. The most frequently occurring score in a distribution is called the ________________.

5. The mean is computed as the ________________ of all the scores divided by the ________________ of scores.

6. The median is the score at the ________________ percentile.

7. When a distribution is lopsided, or ________________, the ________________ (mean/median/mode) can be biased by a few extreme scores.

Objective 10: Describe two measures of variation.

8. Averages derived from scores with ________________(high/low) variability are more reliable than those with ________________(high/low) variability.

9. The measures of variation include the ________________ and the ________________.

10. The range is computed as the ________________

11. The range provides a(n) ________________ (crude/accurate) estimate of variation because it ________________ (is/is not) influenced by extreme scores.

12. The standard deviation is a ________________ (more accurate/less accurate) measure of variation than the range. Unlike the range, the

Statistical Reasoning in Everyday Life (pp. 33–38)

Objective 8: Discuss the importance of statistical principles, and explain how data may be depicted graphically.

1. Researchers use ________________ to help them see and interpret their observations.

2. Once researchers have gathered their ________________ , they must ________________ them. One simple way of visually representing data is to use a
standard deviation _____________
(does/does not) use information from each score in the distribution.

13. The symmetrical, bell-shaped distribution in which most scores fall near the ________________ with fewer and fewer near the extremes is called the ________________

Objective 11: Identify three principles for making generalizations from samples.

14. It is safer to generalize from a ________________ sample than from a ________________ sample.

15. Averages are more reliable when they are based on scores with ________________ (high/low) variability.

16. Small samples provide a ________________ (more/less) reliable basis for generalizing than large samples.

Objective 12: Explain how psychologists decide whether differences are meaningful.

17. Tests of statistical ________________ are used to estimate whether observed differences are real—that is, to make sure that they are not simply the result of ________________ variation. The differences are probably real if the sample averages are ________________ and the difference between them is ________________ (relatively small/relatively large).

18. Statistical significance does not necessarily indicate the importance or ________________ significance of a difference or result.

Frequently Asked Questions About Psychology (pp. 38–43)

Objective 13: Explain the value of simplified laboratory conditions in discovering general principles of behavior.

1. In laboratory experiments, psychologists' concern is not with specific behaviors but with the underlying theoretical ________________.

2. Psychologists conduct experiments on simplified behaviors in a laboratory environment to gain ________________ over the many variables present in the "real world." In doing so, they are able to test ________________ ________________ of behavior that also operate in the real world.

Objective 14: Discuss whether psychological research can be generalized across cultures and genders.

3. Culture refers to the enduring ________________, ________________, ________________, and ________________ shared by a large group of people and passed on from one generation to the next.

4. Although specific attitudes and behaviors vary across cultures, the underlying ________________ are the same. For instance, throughout the world people diagnosed with ________________ exhibit the same ________________ malfunction. Likewise, similarities between the ________________ far outweigh differences.

Objective 15: Explain why psychologists study animals, and discuss the ethics of experimentation with both animals and humans.

5. Many psychologists study animals because they are fascinating. More important, they study animals because of the ________________ (similarities/differences) between humans and other animals. These studies have led to treatments for human ________________ and to a better understanding of human functioning.

6. Some people question whether experiments with animals are ________________. They wonder whether it is right to place the ________________ of humans over those of animals.

7. Opposition to animal experimentation also raises the question of what ________________ should protect the well-being of animals.
Describe the goals of the ethical guidelines for psychological research.

3. To determine the effects of a new drug on memory, one group of people is given a pill that contains the drug. A second group is given a sugar pill that does not contain the drug. This second group constitutes the
   a. random sample.  c. control group.
   b. experimental group. d. test group.

4. Theories are defined as
   a. testable propositions.
   b. factors that may change in response to manipulation.
   c. statistical indexes.
   d. principles that help to organize observations and predict behaviors or events.

5. A psychologist studies the play behavior of young children by watching groups during recess at school. Which type of research is being used?
   a. correlation
   b. case study
   c. experimentation
   d. naturalistic observation

6. To ensure that other researchers can repeat their work, psychologists use
   a. control groups.
   b. random assignment.
   c. double-blind procedures.
   d. operational definitions.

7. The scientific attitude of skepticism is based on the belief that
   a. people are rarely candid in revealing their thoughts.
   b. mental processes can’t be studied objectively.
   c. the scientist’s intuition about behavior is usually correct.
   d. ideas need to be tested against observable evidence.

8. Which of the following is NOT a basic research technique used by psychologists?
   a. description
   b. replication
   c. experimentation
   d. correlation

9. Psychologists’ personal values
   a. have little influence on how their experiments are conducted.
   b. do not influence the interpretation of experimental results because of the use of statistical techniques that guard against subjective bias.

**Objective 16:** Describe how personal values can influence psychologists’ research and its application, and discuss psychology’s potential to manipulate people.

8. Psychologists’ values ________________ (do/do not) influence their theories, observations, and professional advice.

9. Although psychology ________________ (can/cannot) be used to manipulate people, its purpose is to ________________.

**PROGRESS TEST 1**

**Multiple-Choice Questions**

Circle your answers to the following questions and check them with the answers beginning on page 30. If your answer is incorrect, read the explanation for why it is incorrect and then consult the appropriate pages of the text (in parentheses following the correct answer).

1. After detailed study of a gunshot wound victim, a psychologist concludes that the brain region destroyed is likely to be important for memory functions. Which type of research did the psychologist use to deduce this?
   a. the case study  c. correlation
   b. a survey        d. experimentation

2. In an experiment to determine the effects of exercise on motivation, exercise is the
   a. control condition.
   b. intervening variable.
   c. independent variable.
   d. dependent variable.
c. can bias both scientific observation and interpretation of data.
d. have little influence on investigative methods but a significant effect on interpretation.

10. If shoe size and IQ are negatively correlated, which of the following is true?
   a. People with large feet tend to have high IQs.
   b. People with small feet tend to have high IQs.
   c. People with small feet tend to have low IQs.
   d. IQ is unpredictable based on a person's shoe size.

11. Which of the following would be best for determining whether alcohol impairs memory?
   a. case study
   b. naturalistic observation
   c. survey
   d. experiment

12. Well-done surveys measure attitudes in a representative subset, or __________________, of an entire group, or __________________.
   a. population; random sample
   b. control group; experimental group
   c. experimental group; control group
   d. random sample; population

13. What is the mean of the following distribution of scores: 2, 3, 7, 6, 1, 4, 9, 5, 8, 2?
   a. 5
   b. 4
   c. 4.7
   d. 3.7

14. What is the median of the following distribution of scores: 1, 3, 7, 7, 2, 8, 4?
   a. 1
   b. 2
   c. 3
   d. 4

15. What is the mode of the following distribution: 8, 2, 1, 1, 3, 7, 6, 2, 0, 2?
   a. 1
   b. 2
   c. 3
   d. 7

16. In generalizing from a sample to the population, it is important that
   a. the sample be representative of the population.
   b. the sample be large.
   c. the scores in the sample have low variability.
   d. all of these conditions exist.

17. When a difference between two groups is statistically significant, this means that
   a. the difference is statistically real but of little practical significance.
   b. the difference is probably the result of sampling variation.
   c. the difference is not likely to be due to chance variation.
   d. all of these statements are true.

18. A lopsided set of scores that includes a number of extreme or unusual values is said to be
   a. symmetrical.
   b. normal.
   c. skewed.
   d. dispersed.

19. Juwan eagerly opened an online trading account, believing that his market savvy would allow him to pick stocks that would make him a rich day trader. This belief best illustrates
   a. a placebo effect.
   b. illusory correlation.
   c. hindsight bias.
   d. overconfidence.

20. Which of the following is the measure of central tendency that would be most affected by a few extreme scores?
   a. mean
   b. range
   c. median
   d. mode
Matching Items

Match each psychological perspective, school, and subfield with its definition or description.

Terms

1. culture
2. median
3. placebo effect
4. hindsight bias
5. mode
6. range
7. standard deviation
8. scatterplot
9. mean
10. measures of central tendency
11. measures of variation
12. critical thinking
13. illusory correlation

Definitions or Descriptions

a. the mean, median, and mode
b. the difference between the highest and lowest scores
c. the arithmetic average of a set of scores
d. the range and standard deviation
e. the most frequently occurring score
f. the middle score in a distribution
g. a graphed cluster of dots depicting the values of two variables
h. a measure of variation based on every score
i. shared ideas and behaviors passed from one generation to the next
j. “I-knew-it-all-along” phenomenon
k. reasoning that does not blindly accept arguments
l. experimental results caused by expectations alone
m. false perception of a relationship between two variables

PROGRESS TEST 2

Progress Test 2 should be completed during a final chapter review. Answer the following questions after you thoroughly understand the correct answers for the section reviews and Progress Test 1.

Multiple-Choice Questions

1. Which of the following research methods does not belong with the others?
   a. case study
   b. survey
   c. naturalistic observation
   d. experiment

2. To prevent the possibility that a placebo effect or researchers’ expectations will influence a study’s results, scientists employ
   a. control groups.
   b. experimental groups.
   c. random assignment.
   d. the double-blind procedure.

3. Which statement about the ethics of experimentation with people and animals is false?
   a. Only a small percentage of animal experiments use shock.
   b. Allegations that psychologists routinely subject animals to pain, starvation, and other inhumane conditions have been proven untrue.
   c. The American Psychological Association and the British Psychological Society have set strict guidelines for the care and treatment of human and animal subjects.
   d. More animals are used in psychological research than are killed by humane animal shelters.

4. In an experiment to determine the effects of attention on memory, memory is the
   a. control condition.
   b. intervening variable.
   c. independent variable.
   d. dependent variable.

5. Which of the following is NOT characteristic of a normal curve?
   a. The distribution is bell-shaped and symmetrical.
   b. Most scores fall near the mean.
   c. About 95 percent of all scores fall within one standard deviation on either side of the mean.
   d. The distribution describes many types of psychological data.

6. Which of the following best describes the hindsight bias?
   a. Events seem more predictable before they have occurred.
   b. Events seem more predictable after they have occurred.
c. A person's intuition is usually correct.
d. A person's intuition is usually not correct.

7. The procedure designed to ensure that the experimental and control groups do not differ in any way that might affect the experiment's results is called
a. variable controlling.
b. random assignment.
c. representative sampling.
d. stratification.

8. Illusory correlation refers to
a. the perception that two negatively correlated variables are positively correlated.
b. the perception of a correlation where there is none.
c. an insignificant correlation.
d. a correlation that equals -1.0.

9. In generalizing from a sample to the population, it is important that
a. the sample be representative.
b. the sample be nonrandom.
c. the sample not be too large.
d. all of these conditions exist.

10. The strength of the relationship between two vivid events will most likely be
a. significant.
b. positive.
c. negative.
d. overestimated.

11. Which of the following is true, according to the text?
a. Because laboratory experiments are artificial, any principles discovered cannot be applied to everyday behaviors.
b. No psychological theory can be considered a good one until it produces testable predictions.
c. Psychology's theories reflect common sense.
d. Psychology has few ties to other disciplines.

12. Which type of research would allow you to determine whether students' grades accurately predict later income?
a. case study  c. experimentation
b. naturalistic observation  d. correlation

13. In a test of the effects of air pollution, groups of students performed a reaction-time task in a polluted or an unpolluted room. To what condition were students in the unpolluted room exposed?
a. experimental  c. randomly assigned
b. control  d. dependent

14. In order to study the effects of lighting on mood, Dr. Cooper had students fill out questionnaires in brightly lit or dimly lit rooms. In this study, the independent variable consisted of
a. the number of students assigned to each group.
b. the students' responses to the questionnaire.
c. the room lighting.
d. the subject matter of the questions asked.

15. What is the mode of the following distribution of scores: 2, 2, 4, 4, 4, 14?
a. 2  c. 5
b. 4  d. 6

16. What is the mean of the following distribution of scores: 2, 5, 8, 10, 11, 4, 6, 9, 1, 4?
a. 2  c. 6
b. 10  d. 15

17. What is the median of the following distribution: 10, 7, 5, 11, 8, 6, 9?
a. 6  c. 8
b. 7  d. 9

18. Which of the following is the measure of variation that is most affected by extreme scores?
a. mean  c. mode
b. standard deviation  d. range

19. The set of scores that would likely be most representative of the population from which it was drawn would be a sample with a relatively
a. large standard deviation.
b. small standard deviation.
c. large range.
d. small range.

20. If a difference between two samples is NOT statistically significant, which of the following can be concluded?
a. The difference is probably not a true one.
b. The difference is probably not reliable.
c. The difference could be due to sampling variation.
d. All of these conclusions can be reached.
Matching Items
Match each term with its definition or description.

Terms

1. hypothesis
2. theory
3. independent variable
4. dependent variable
5. experimental group
6. control group
7. case study
8. survey
9. replication
10. random assignment
11. experiment
12. double-blind

Definitions or Descriptions

a. an in-depth observational study of one person
b. the variable being manipulated in an experiment
c. the variable being measured in an experiment
d. the “treatment-absent” group in an experiment
e. testable proposition
f. repeating an experiment to see whether the same results are obtained
g. the process in which research participants are selected by chance for different groups in an experiment
h. an explanation using an integrated set of principles that organizes observations and predicts behaviors or events
i. the research strategy in which the effects of one or more variables on behavior are tested
j. the “treatment-present” group in an experiment
k. the research strategy in which a representative sample of individuals is questioned
l. experimental procedure in which neither the research participant nor the experimenter knows which condition the participant is in

3. The concept of control is important in psychological research because
a. without control over independent and dependent variables, researchers cannot describe, predict, or explain behavior.
b. experimental control allows researchers to study the influence of one or two independent variables on a dependent variable while holding other potential influences constant.
c. without experimental control, results cannot be generalized from a sample to a population.
d. of all of these reasons.

4. Martina believes that high doses of caffeine slow a person’s reaction time. To test this belief, she has five friends each drink three 8-ounce cups of coffee and then measures their reaction time on a learning task. What is wrong with Martina’s research strategy?
a. No independent variable is specified.
b. No dependent variable is specified.
c. There is no control condition.
d. There is no provision for replication of the findings.
5. A researcher was interested in determining whether her students' test performance could be predicted from their proximity to the front of the classroom. So she matched her students' scores on a math test with their seating position. This study is an example of
   a. experimentation.
   b. correlational research.
   c. a survey.
   d. naturalistic observation.

6. Your best friend criticizes psychological research for being artificial and having no relevance to behavior in real life. In defense of psychology's use of laboratory experiments you point out that
   a. psychologists make every attempt to avoid artificiality by setting up experiments that closely simulate real-world environments.
   b. psychologists who conduct basic research are not concerned with the applicability of their findings to the real world.
   c. most psychological research is not conducted in a laboratory environment.
   d. psychologists intentionally study behavior in simplified environments in order to gain greater control over variables and to test general principles that help to explain many behaviors.

7. A professor constructs a questionnaire to determine how students at the university feel about nuclear disarmament. Which of the following techniques should be used in order to survey a random sample of the student body?
   a. Every student should be sent the questionnaire.
   b. Only students majoring in psychology should be asked to complete the questionnaire.
   c. Only students living on campus should be asked to complete the questionnaire.
   d. From an alphabetical listing of all students, every tenth (or fifteenth, e.g.) student should be asked to complete the questionnaire.

8. If eating saturated fat and the likelihood of contracting cancer are positively correlated, which of the following is true?
   a. Saturated fat causes cancer.
   b. People who are prone to develop cancer prefer foods containing saturated fat.
   c. A separate factor links the consumption of saturated fat to cancer.
   d. None of these statements are necessarily true.

9. The scientific attitude in psychology refers to the fact that
   a. psychologists study only observable behaviors.
   b. psychologists study thoughts and actions with an attitude of skepticism and derive their conclusions from direct observations.
   c. psychological research should be free of value judgments.
   d. all of these statements are true.

10. Rashad, who is participating in a psychology experiment on the effects of alcohol on perception, is truthfully told by the experimenter that he has been assigned to the "high-dose condition." What is wrong with this experiment?
   a. There is no control condition.
   b. Rashad's expectations concerning the effects of "high doses" of alcohol on perception may influence his performance.
   c. Rashad was given a placebo, so the results may be tainted.
   d. All of these statements are correct.

11. A friend majoring in anthropology is critical of psychological research because it often ignores the influence of culture on thoughts and actions. You point out that
   a. there is very little evidence that cultural diversity has a significant effect on specific behaviors and attitudes.
   b. most researchers assign participants to experimental and control conditions in such a way as to fairly represent the cultural diversity of the population under study.
   c. it is impossible for psychologists to control for every possible variable that might influence research participants.
   d. even when specific thoughts and actions vary across cultures, as they often do, the underlying processes are much the same.

12. The scientific attitude of humility is based on the idea that
   a. researchers must evaluate new ideas and theories objectively rather than accept them blindly.
   b. scientific theories must be testable.
   c. simple explanations of behavior make better theories than do complex explanations.
   d. researchers must be prepared to reject their own ideas in the face of conflicting evidence.
13. Which of the following procedures is an example of the use of a placebo?
   a. In a test of the effects of a drug on memory, a participant is led to believe that a harmless pill actually contains an active drug.
   b. A participant in an experiment is led to believe that a pill, which actually contains an active drug, is harmless.
   c. Participants in an experiment are not told which treatment condition is in effect.
   d. Neither the participants nor the experimenter knows which treatment condition is in effect.

14. If height and body weight are positively correlated, which of the following is true?
   a. There is a cause-effect relationship between height and weight.
   b. As height increases, weight decreases.
   c. Knowing a person’s height, one can predict his or her weight.
   d. All of these statements are true.

15. The football team’s punter wants to determine how consistent his punting distances have been during the past season. He should compute the
   a. mean
   b. median
   c. mode
   d. standard deviation

16. Joe believes that his basketball game is always best when he wears his old gray athletic socks. Joe is a victim of the phenomenon called
   a. statistical significance
   b. overconfidence
   c. illusory correlation
   d. hindsight bias

17. Esteban refuses to be persuaded by an advertiser’s claim that people using their brand of gasoline average 50 miles per gallon. His decision probably is based on
   a. the possibility that the average is the mean, which could be artificially inflated by a few extreme scores.
   b. the absence of information about the size of the sample studied.
   c. the absence of information about the variation in sample scores.
   d. all of these statements.

18. Bob scored 43 out of 70 points on his psychology exam. He was worried until he discovered that most of the class earned the same score. Bob’s score was equal to the
   a. mean
   b. median
   c. mode
   d. range

19. The four families on your block all have annual household incomes of $25,000. If a new family with an annual income of $75,000 moved in, which measure of central tendency would be most affected?
   a. mean
   b. median
   c. mode
   d. standard deviation

20. Dr. Salazar recently completed an experiment in which she compared reasoning ability in a sample of females and a sample of males. The means of the female and male samples equaled 21 and 19, respectively, on a 25-point scale. A statistical test revealed that her results were not statistically significant. What can Dr. Salazar conclude?
   a. Females have superior reasoning ability.
   b. The difference in the means of the two samples is probably due to chance variation.
   c. The difference in the means of the two samples is reliable.
   d. She cannot reach any of these conclusions.

Essay Question
Elio has a theory that regular exercise for one month can improve thinking. Help him design an experiment evaluating this theory. (Use the space below to list the points you want to make, and organize them. Then write the essay on a separate piece of paper.)

KEY TERMS

Writing Definitions
Using your own words, on a separate piece of paper write a brief definition or explanation of each of the following.

1. hindsight bias
2. critical thinking
3. theory
4. hypothesis
5. operational definition
6. replication
7. case study
8. survey
9. population
10. random sample
11. naturalistic observation
12. correlation
13. correlation coefficient
14. scatterplot
15. illusory correlation
16. experiment
17. random assignment
18. double-blind procedure
19. placebo effect
20. experimental group
21. control group
22. independent variable
23. dependent variable
24. mode
25. mean
26. median
27. range
28. standard deviation
29. normal curve
30. statistical significance
31. culture
Cross-Check

As you learned in the Prologue, reviewing and overlearning of material are important to the learning process. After you have written the definitions of the key terms in this chapter, you should complete the crossword puzzle to ensure that you can reverse the process—recognize the term, given the definition.

ACROSS
1. Score that falls at the 50th percentile, cutting a distribution in half.
7. Explanation using an integrated set of principles that organizes and predicts behaviors or events.
9. Most frequently occurring score in a distribution.
13. Descriptive research strategy in which one person is studied in great depth.
14. Measure of variation computed as the difference between the highest and lowest scores in a distribution.
15. Measure of central tendency computed by adding the scores in a distribution and dividing by the number of scores.
18. Perception of a correlation between two events where none exists.
19. Descriptive research technique in which a representative, random sample of people is questioned about their attitudes or behaviors.
20. Depiction of the relationship between two sets of scores by means of a graphed cluster of dots.
21. Sample in which every member of the population has an equal chance of being included.

DOWN
2. Condition in which research participants are exposed to the independent variable being studied.
3. In an experiment, the variable being manipulated and tested by the investigator.
4. Research method in which behavior is observed and recorded in naturally occurring situations without any manipulation or control.
5. A precise definition of the procedures used to identify a variable.
6. Careful reasoning that examines assumptions, discerns hidden values, evaluates evidence, and assesses conclusions.
8. The bias in which we believe, after learning an outcome, that we could have foreseen it.
10. Control procedure in which neither the experimenter nor the research participants are aware of which condition is in effect.
11. Testable prediction, often implied by a theory.
12. Measure that indicates the extent to which one factor predicts another factor.
16. Experimental condition in which the treatment of interest is withheld.
17. When a research participant's expectations produce the results of an experiment, it is called a _____ effect.